

REMARKS

Claims 1-5, 7, 8, and 10-36 appear in this application for the Examiner's review and consideration. Of these, claims 23 and 35 are presently amended to correct typographical errors. These amendments are fully supported in the originally filed specification, claims, and drawings, and since the errors are purely typographical, the amendments do not introduce any new substantive issues.

In the Office Action, claim 23 was objected to due to a typographical error which has now been corrected. Claim 23 was also amended to correct the recitation that the support frame portion stiffens the lower framework. It is clear from the previous version of this claim that it is the lower framework that is stiffened, instead of an "upper framework", which is not ever defined previously in the claim. Also, in the same phrase where this change was made, a stiffening association is defined between the upper frame portion and the lower framework, which is more consistent with the rest of the claim. Consequently, this amendment does not introduce new substantive issues. Claim 35 was amended to correct an additional typographical error.

Claims 1-5, 7, 8, 10-13, 15-19, 21-25, 27-29, and 31-36 were rejected under 35 U.S.C. § 102(b) over Nakagawa. Claim 1 is directed to a vehicle frame that includes first and second frame portions. The first frame portion has a plurality of struts associated with each other to form a first framework to support the frame, and the second frame portion is separably associated with the first framework of struts in an association in which it significantly increases the stiffness thereof. The associated first and second frame portions cooperatively define an interior cavity between them, and the interior cavity is dimensioned to house a component of the propulsion system propelling the vehicle. Additionally, claim 1 recites that the struts of the framework include a first, higher strut; a second, lower strut; and a third strut that is offset horizontally with respect to the other two. These struts are disposed around and define a portion of the cavity.

Claim 23 also defines a lower framework formed by the struts to support the frame, an upper frame portion that comprises a skin member associable with the lower framework in a stiffening association for significantly increasing the stiffness of the lower framework.

In characterizing the disclosure of Nakagawa, the elements that are called out in the Office Action are configured and are assembled in the Nakagawa teaching very

differently than in the independent claims. For example, nowhere in Nakagawa is the alleged first framework that is made from a plurality of struts that together define an interior cavity. Instead, the main frame 2 of Nakagawa is shown as a unitary molded frame with several webs, as shown clearly in Fig. 9. The main frame 2 has a lower front portion, shown at the bottom left of Fig. 11, and an upper rear portion that extends rearward at the top of Fig. 11.

The Office Action defines a first strut as being the upper rear portion of the main frame, a second strut as being rear cross member 2e, which as shown in Figs. 10 and 11 extends laterally from left to right of the vehicle and is disposed midway in a vertical direction between the upper rear part of the main frame 2 and the front lower part of the main frame 2. The Office Action also defines as third struts the right and left side members 2c that are disposed on the front lower portion of the main frame 2. The argument is then made in the Office Action that these three "struts" are disposed around and define a portion of an "undefined cavity", which is allegedly depicted in Fig. 2, thus allegedly defining lateral and longitudinal sides of the cavity.

It is clear from Figs. 2, 6, 10, and 11, for example, that the members that the Examiner has characterized as first, second, and third struts are in fact not disposed around, and do not define, any cavity. Perhaps the cavity is undefined in Fig. 2 because it does not exist. As shown in Fig. 6, what the Office Action calls a first strut extends in an opposite direction from what the Office Action calls the third struts. What the Office Action calls a second strut extends in space somewhere in between the "first" and the "third struts". There is simply no space surrounded by the combination of these alleged struts that were defined by the Examiner. As shown in Fig. 12, there is an opening between side members 2c, which is open at the top and at the bottom, but this opening is not enclosed or defined by any of the rear cross member 2e or by the upper rear portion of the main frame 2. The upper rear portion extends completely away from this opening between the side members 2c, and cannot be said to enclose or define this opening. Similarly, the cross member 2e extends laterally at a vertical position between the side members 2c and the upper rear portion of the main frame 2, and cannot reasonably be said to enclose any cavity defined by both of the other struts that the Examiner defined to be in Nakagawa.

The Office Action refers to Fig. 6 in arguing that a second frame portion includes head pipe post 51 and cowl 18. But the cowl 18 of the Nakagawa disclosure is merely a traditional faring that is attached, non-structurally, to hide the actual structure of

the vehicle. In the same breath, the Office Action goes on to state that the first frame portion, which previously had been defined as being the main frame 2, now includes head tube 52. As clearly seen in Fig. 6, head tube 52 is welded to head pipe post 51, which in itself is fastened to the main frame 2. There is thus no possible way that head tube 52 can be reasonably characterized as being part of the first frame portion or framework. Moreover, the claims define that the second frame portion is separably associable with the first framework in the recited stiffening association. Thus, even if head tube 52 were part of the first frame portion, then the head pipe post 51 would not be separable therefrom.

In addition, the attachment of the head pipe post 51 to the front of the main frame 2 does not significantly increase the stiffness of the main frame 2. As evident in Fig. 9, the head pipe post 51 is merely bolted to a protrusion on the main frame 2, and one of ordinary skill in the art would immediately understand that this does not provide any additional structural bracing and is not attached in any manner that would significantly contribute to the stiffness of the main frame 2. In addition, the increased stiffness recited in claims 1 and 23 provides the surprising benefit over all the references of record in that it provides a framework that is stronger and lighter than the traditional vehicle frames, such as the Nakagawa frame, since the struts of the framework extend around the cavity that houses propulsion components. Consequently, bending moments of inertia of the frame can be maximized, and the cavity is naturally protected by these structural struts that are connected together to form the framework. The second frame portion is surprisingly used to significantly further stiffen the framework, which can thus decrease the weight and size of the spaced out framework struts that define the cavity.

With respect to claim 23, the Examiner argued that the lower frame portion included an alleged first strut group, including side members 2c and cross member 2e, which were argued to be disposed to one side of a cavity. A second strut group was alleged to include the head pipe post 51 and the head pipe 52, which were stated as being on an opposite side of the cavity in the Office Action. A portion of the cowl 18 was also alleged to be part of this lower frame portion. The Examiner then argues that an upper frame portion is formed by a portion of the cowl 18, which allegedly would increase the stiffness of an upper framework that includes the head pipe 52. As explained above, number 18 in Nakagawa is a non-structural cowl. There is absolutely no indication that this cowl should have any structural value whatsoever or that it would possibly be constructed to increase the stiffness of anything to which it is attached to any measurable degree. Providing a stiff cowl would be contrary to what is known in the art,

in which cowls are typically made of plastic or another soft and light material, which are merely attached to the structural underlying frame to make the vehicle look attractive, or to provide aerodynamic benefits. Consequently, the elements defined in claim 23 are actually not found in Nakagawa, and the characterization in the Office Action of Nakagawa is unfounded.

Claim 32 also defines that the longitudinal struts of the first and second group are in compression, and that the second frame position extends over and across the interior cavity and is structurally associated with the longitudinal portions for substantially increasing the stiffness thereof. One of ordinary skill in the art would, however, understand that under a normal loading, neither the portions of the main frame 2 identified in the Office Action or the head pipe post 51 are in compression. They are purely in a bending stress condition, or in tension, since the head pipe post hangs from the steering fork and the main frame 2 merely resists bending between this and the rear wheel support, since they are at the lowest portion of the frame.

It would be understood by one of ordinary skill in the art that struts in compression are capable of buckling, and must be made stronger than if they were in tension. The invention of claim 32 provides the surprising benefit that spaced struts that are in compression due to their arrangement in the scooter frame can be made with lighter weight and with less bracing, since the second or upper frame portion is used to increase their stiffness, while advantageously used to define part of the recited cavity. As a result, far more access to the interior cavity can be provided without blocking access with any cross pieces that would restrict access to the cavity, or by providing a much heavier structure. For this additional reason, claim 32 is patentably distinct over Nakagawa.

Nakagawa shows a contrary construction to that of the independent claims. In the Nakagawa construction, the structural main frame 2 is narrow along any part along the scooter. At the front end of the main frame 2, it is vertically narrow; at the upright portion of the main frame 2, it is horizontally narrow; and at the rear frame of the main frame 2 it is vertically narrow. The stiffened parts of the main frame 2 are not assembled as a framework that encloses any common cavity, and thus are far more flexible than a framework of struts that is sufficiently large to cooperatively enclose and define an internal cavity. Furthermore, the head pipe post 51, as explained above, is not attached to provide any increased stiffness to the main frame 2, since it is only attached thereto at a single point. It does not bridge to main frame 2 from any one part to any other part, and thus does not provide any additional load path to stiffen the main frame 2. Additionally,

since the head pipe post extends away from the main frame 2 by a long moment arm, if the head pipe post 51 and the main frame 2 were considered to be a vehicle frame, then the head pipe post would contribute to the flexibility of the frame, not its stiffness, since it would allow the frame to be bent from points even further apart, which makes structures easier to flex.

In addition, claim 23 defines a seat that is supportedly mounted on the upper frame portion. The only seat in Nakagawa is supported on the upper rear part of the main frame 2 and is neither supportedly mounted on the non-structural cowl 18 or the head pipe 52, which is the alleged upper frame portion on page 4 of the Office Action. Similarly, claim 1 defines that the first framework and second frame portion are configured for supporting a rider sitting on the vehicle frame, whereas the defined frame portions in the Office Action require the head pipe post 51 to be one of the frame portions, and is not any part of the vehicle that both defines part of the interior space and supports the rider sitting on the vehicle frame.

With respect to claim 32, the Examiner alleged that the struts that were defined in the Office Action itself each comprise a longitudinal strut. To use the language of the claims, the Office Action characterized head pipe post 51 as running generally longitudinally. It is clear from Fig. 6, however, that this head pipe post 51 runs almost entirely vertically, and cannot reasonably be characterized as running generally longitudinally. Additionally, the objection ignores the recitation in claim 32 that, not only do the first and second group of struts each comprise a longitudinal strut, but that the longitudinal struts are spaced from each other substantially on opposite lateral sides of the interior cavity. What the Examiner defined as the longitudinal struts are not spaced on lateral sides of any part of the vehicle. For instance, head pipe post 51 is disposed centrally along the longitudinal axis of the vehicle, and is actually disposed laterally centrally between the side members 2c. With respect to claim 33, which further defines additional struts that connect the first and second groups of struts and that are disposed on additional sides of the cavity, the Examiner contends that additional "struts" include bearing 2a and front swing arm 42, and that these are disposed on additional sides of the cavity. These structures are shown in Fig. 9 of Nakagawa, and bearings 2a are merely bearings that protrude out of the main frame 2 away from all of the other portions that have been defined so far by the Examiner, and thus cannot be considered to enclose any internal cavity that is cooperatively enclosed by all of the other parts that have been identified in the Office Action. Swing arm 42 is exactly that, a swing arm, and cannot

reasonably be characterized as part of a framework of a vehicle frame that can be stiffened. Swing arm 42 is also disposed longitudinally further from the other members that have been discussed so far, and is also not disposed on any lateral side or even adjacent to any cavity that is defined by the additional members.

Consequently, neither claim 1, 23, nor 32 is anticipated by Nakagawa, and as explained above, they are also not obvious thereover since Nakagawa provides no suggestion of the claimed vehicle frame and does not foresee the surprising benefits provided thereby.

Claim 2 defines skin members that are structurally associated with the struts to close at least portions of openings defined between the struts. Claim 3 defines that the framework has a stiffness and that the skin member of the first frame portion is configured and associated with the framework for significantly increasing the stiffness thereof. As explained above, the only member that the Examiner characterized as a skin is cowl 18, for which the disclosure does not support the allegation that it would inherently add significantly to the stiffness of the framework. Once again, the cowl is the typical, non-structural, plastic faring that is attaching to the underlying frame structure of a traditional vehicle. Claim 4 further defines that a plurality of such stiffening skins are coupled with the framework. Claim 12 defines that the second frame portion comprises a skin configured for substantially contributing to the stiffness of the frame. For the same reasons as just explained, there is no teaching or suggestion of this in Nakagawa. Claim 31 defines that the skins close off 75% of the openings, and there is certainly no structural skin member with this level of coverage in Nakagawa, even if an internal cavity were assumed to be defined. Consequently, claims 2-4, 12, and 31 are neither taught nor suggested by Nakagawa.

Claim 5 recites that the skin member of the first frame portion, which was defined in claim 2 as being structurally associated with the struts, comprises a battery tray inside the interior cavity that is configured for supporting a battery to power the propulsion system. Also, claim 8 defines a concave bracket configured for receiving and supporting a bottom portion of the tray. The battery tray also is associated with the first framework for significantly stiffening the first framework. In the rejection, the Examiner picked holding plate 49, which is seen in Fig. 9, as being provided to support a battery tray 64. Holding plate 39, however, is attached to the front swing arm 42 and is simply provided to hold a resin spring, not a battery. This holding plate 49 is also disposed forwardly beyond the other members that were alleged to define an interior cavity, and

certainly neither supports anything within an interior cavity defined by struts of a framework, nor stiffens any framework, since it is merely attached to the front swing arm 42. Claim 7 defines that the first and second frame portions are configured to permit removal of the battery when these portions are separated. It is clear, for example, from Fig. 6, that removal of the head pipe post 51 has absolutely no effect on the removability of any batteries or any battery tray

Claim 10, which depends from claim 1, defines that a plurality of the struts are welded to each other. The only reference to this in the office action is the fact that head pipe post 51 is welded to head pipe 52. This weld is irrelevant, since these two members do not form, and are not part of a framework of struts and are nowhere close to enclosing any interior space, and instead are provided at the very furthest point from the main frame 2 and from any other portions that were alleged to be parts of a frame of the Nakagawa vehicle. It is also noted that main frame 2 is shown as a molded, forged, or cast structure, which is evident from viewing any of the figures that show cross-sections or perspective views thereof. Claim 10 is thus patentably distinct from Nakagawa.

Claim 15 depends from claim 1 and recites that the first frame portion is a lower frame portion disposed beneath the second frame portion, which is an upper frame portion. Claim 16 further defines that the lower portion comprises a head tube that rotatably receives a steering tube mounted to a steerable wheel of the vehicle. In the Office Action, the head pipe post 51 and head pipe 52 are argued as being a second frame portion, since these members are separable from the main frame tube. This characterization, however, falls short of the claimed vehicle frame, since the claims would require that the first, lower portion comprise the head tube, as opposed to the second, upper portion. Not only is claim 16 thus contrary to the teaching of Nakagawa, but it further provides the surprising advantage that the lower frame portion can be configured to absorb all the shocks directly from the wheel and the upper frame portion can be mainly used to provide stiffening to the lower frame portion, which would otherwise need to be heavier without the upper frame portion to provide increased strength.

With regard to claim 18, the argument is made in the Office Action that the combination of the various portions recited by the Examiner would increase the longitudinal stiffness of the frame, inherently, by a factor of at least 1.2. There is absolutely no support for this allegation of inherency. An increase in a factor of 1.2 means that the frame is 20% stiffer than it would be without the second frame portion. In

other words, by taking the logic of the Office Action, it would mean that it is inherent that the frame is 20% stiffer than it would be by removing the head pipe post 51 and non-structural cowl 18.

As explained above, the head pipe post 51 and the non-structural cowl 18 do not contribute at all to the stiffness of the main frame 2. In any event, such an increase in stiffness by these members that are attached at a small point of the main frame 2 or that are attached non-structurally would not have anywhere near a small fraction of the claimed increase. In fact, the attachment of the head pipe post 51, since it extends even further from the main frame 2, provides a lever arm that will facilitate the bending of the frame as a whole, overall decreasing its stiffness, contrary to what is claimed. One of ordinary skill in the art would not have found any inherency that the combination of the members mentioned in the Office Action could provide such a large increase in stiffness of the frame as claimed.

Claim 29 defines that the associated first and second frame portions of claim 1 cooperatively and substantially enclose at least top, bottom, front, and lateral sides of the interior cavity, and that the first, second, and third struts define the lateral sides. As explained above, what the Examiner calls first, second, and third struts are disposed at completely different longitudinal positions in the Nakagawa vehicle, and cannot reasonably be said to define lateral sides. Additionally, since each portion that the Examiner alleges is a strut in Nakagawa sticks out in a different direction away from each other, no cavity is enclosed thereby. Even if the side members 2c were assumed to define some lower side of a cavity, there would be no structural member to enclose the top of the cavity, which is wide open, or to enclose the lateral sides of the cavity which would also be wide open, except at their very bottom-most part. The front of the cavity can also not be said to be enclosed by any structural frame portion, since only a narrow head pipe post 51 extends vertically up the center of the front of the main frame 2. The vehicle of Nakagawa is thus completely different from the invention of claim 29, and thus claim 29 is patentable thereover.

Similarly, claim 34 defines that the plurality of struts define lateral and longitudinal sides of the cavity. Certainly, the longitudinal sides are mostly open, and are not defined by any struts or framework. The mere fact that the bottom may be defined by the side members 2c, taking the definitions from the Office Action itself, is not sufficient to anticipate or suggest the claim since the sides themselves are undefined and are wide open in Nakagawa.

Claim 35 depends from claim 1 and further defines a fourth strut disposed below the third strut and offset horizontally with respect to the first and second struts. Thus, the first and second struts are disposed to a first side of the cavity and the third and fourth struts are disposed to a second side of the cavity. This claim is further directed to the preferred embodiment, in which the framework has struts in the recited positions to further define the interior cavity. There is no strut that can be called a fourth strut under the definition of claim 35 that can be found in Nakagawa. Specifically, the Examiner alleges that the upper rear portion of the main frame 2 is a first strut, that the cross member 2e is a second strut, and that the side members 2c are third struts. Even though all these struts extend in different directions and do not enclose any interior cavity, a fourth strut cannot be found that is disposed on the same side of any cavity that is cooperatively defined by the other alleged struts and that is on the same side thereof as side members 2c. Claim 36 further defines a group of struts that connect the first and second struts to the third and fourth struts, and that are disposed on yet a third side of the cavity. Such a construction cannot be found anywhere in Nakagawa. The Examiner alleges that bearings 2a are fourth struts, but clearly these bearings are not struts in a framework and are disposed in a completely wrong direction to enclose any interior cavity in cooperation with other alleged struts, which protrude in all sorts of directions, but not disposed around a common interior space. Additionally, case body 62 is characterized as being a strut, wherein it is clearly visible that case body 62 widely is extensive in two dimensions in the horizontal plane, and cannot be called a strut. Case body 62 is instead configured as a plate, which one of ordinary skill in the art would not consider a strut, which is known as an elongated structural member. Consequently, claims 35 and 36 are neither taught nor suggested by Nakagawa.

As evident from the above discussion, it appears that members that the Office Action identifies in Nakagawa are made without any regard to the claimed relation therebetween that is recited in the above-discussed claims or their positions around an interior cavity. There is no feasible way even to rearrange these portions of the Nakagawa frame so that a framework of struts is provided that encloses a common cavity, and that a second associable frame portion stiffens the cavity. Such a rearrangement could only be made using impermissible hindsight based on the disclosure of the present application, and would completely change the character of the Nakagawa frame. Consequently, the rejection of the claims discussed above and all the claims dependent thereon should be withdrawn.

Claim 30 was rejected under 35 U.S.C. § 103(a) over Nakagawa, in view of Stevenson and Ono, and claims 26-28 over Nakagawa in view of Sugioka.

Claim 30 recites that struts of the first frame portion of claim 3, and the skin member, which was recited as being structural and significantly increasing the frame stiffness, are made of aluminum or an alloy thereof, and welded together. There is no motivation to combine Nakagawa and Stevenson, since the types of construction of each of these frames are significantly different from each other. The Stevenson frame is a monocoque frame, which employs skins to transfer and withstand the main structural loads, without employing a substructure that is a framework of struts, whereas the Nakagawa frame is extensively thin, and does not primarily rely on any skins to transfer loads. One of ordinary skill in the art would not have found any motivations to use the skins of Stevenson in the Nakagawa frame since the Nakagawa frame is structurally complete. There is no suggestion or even an indication as to how these two types of frame could possibly be combined, since not only is there no need for structural skins in Nakagawa, but there is no monocoque enclosure to provide. Moreover, it would be counter to the teaching of Nakagawa to replace cowl 18 with any kind of structural skins, since these are meant purely for nonstructural purposes, and making them structural would very seriously increase the weight of the vehicle, which would be undesirable. Furthermore, there are no types of skins that are welded to the underlying frame on Nakagawa. Consequently, even the cumulative teaching of Stevenson and Nakagawa do not teach skin members that are welded to a framework of struts made of the same material, let alone aluminum. The construction of claim 30 provides the surprising advantages of a semi-monocoque construction, with structural materials that are structurally attached by welding to increase the frame stiffness. Consequently, claim 30 is not taught or suggested by the references of record.

With respect to claims 26 and 27, the Examiner alleges that Sugioka shows the possible dimensions recited in these claims in at least Fig. 1. There is no basis for this assertion, especially since Sugioka shows all the batteries in a compartment that is held beneath the floor of the scooter, and it is very unlikely that the height of this compartment could be increased without the batteries dragging on the ground, since the height of the compartment cannot be increased above the tubular frame that is above the battery compartment and from which it hangs (*see, e.g.,* Fig. 4). Conversely, raising members 104 would raise the floor for the rider's feet, making for an uncomfortable seating position, or an undesirably raised center of gravity. The Sugioka teaching does not

disclose or suggest any manner of obtaining such a tall cavity using its frame.

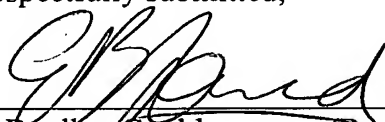
Additionally, the tall height of the cavity recited in claim 26 further increases the bending moments of inertia of the inventive frame, further allowing a lighter structure to be provided while also providing a very large and easily accessible interior cavity to house sizeable components, such as batteries or other propulsion systems. Consequently, claim 26 is patentable over any combination of the references of record.

In view of the foregoing, it is believed that the entire application is now in condition for allowance, early notice of which would be appreciated. Should the Examiner not agree, then a personal or telephonic interview is respectfully requested to discuss any remaining issues in an effort to expedite the allowance of this application.

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